

claim 1 of Kishii). At least for this reason, Applicants submit that Kishii does not anticipate claim 1, which discloses rinsing with an agent comprising hydrogen peroxide.

In the FOA, the Patent Office states that "[a]pplicant has not established that the term "rinse", as understood by one of ordinary skill in the art to be limited to the definition provided on page 5 of the amendment filed 9-24-01." (FOA, page 2). Applicants again submit that those skilled in the art recognize that "clean" and "rinse" may concern separate concepts in the art of semiconductor processing. In the response filed on September 24, 2001 (the "ROA"), Applicants pointed out that "cleaning" and "rinsing" have separate definitions in J. Ruzyllo's Semiconductor Glossary at <<http://semiconductorglossary.com>>. Applicants believe that by pointing out in the ROA that these terms have been defined separately by one skilled in the art, Applicants provided a sufficient basis to establish that these terms are not considered synonymous to those skilled in the art.

In further support of Applicants' position, Applicants submit herewith, as Exhibit "A", a copy of page 91 of the book Semiconductor Terminology by Michael Heynes, Ph.D. and Anne K. Miller (Semiconductor Services, Third Edition, 1999). As stated on the attached page, "rinse" is defined by the authors as "[t]he removal of cleaning solutions, etchants or developers etc, from the wafer using water. This process stops processes by removing the active chemical from the surface."

The definition of "rinse" found in Semiconductor Terminology, by stating that "rinse" is "the removal of cleaning solutions . . .", clearly indicates that "clean" and "rinse" are capable of being regarded as separate processes. Applicants submit these definitions for the purpose of supporting the proposition that "cleaning" and "rinsing" may be regarded as separate and distinct concepts or processes by those skilled in the art of semiconductor processing.

In the FOA, the Patent Office cites a definition of the term "rinse" from Merriam-Webster's On-Line Collegiate Dictionary. The Court of Appeals for the Federal Circuit has "previously cautioned against the use of non-scientific dictionaries lest dictionary definitions be converted into technical terms of art having legal, not linguistic significance." Bell Atlantic Network Servs., Inc. v. Covad Comms. Group, Inc., 262 F.3d 1258,1268 (Fed. Cir. 2001), citing Multiform Desiccants, Inc. v. Medzam, Ltd., 133 F.3d 1473, 1478 (Fed. Cir. 1998). Therefore, when determining the meaning of a term to one of ordinary skill in the art, definitions found in scientific dictionaries are preferable to definitions found in non-scientific dictionaries. Accordingly, given that "rinse" is defined in a number of scientific dictionaries that pertain directly to the art of semiconductor processing, Applicants submit that the Patent Office improperly relied on a definition from a non-scientific dictionary.

Applicants note that the scientific dictionary definitions cited above state that rinsing is performed using water. The Patent Office states that because the agent used in rinsing (claim 1),

the solution for rinsing (claim 9) and the rinsing solution (claim 18) disclosed by Applicants comprise hydrogen peroxide, the rinsing recited in these claims falls outside of the definition of "rinse" provided in the J.Ruzylo's online semiconductor glossary. Applicants note that the definitions in J.Ruzylo's online semiconductor glossary were presented in the ROA merely to demonstrate that the terms "clean" and "rinse" may be considered separate concepts by those skilled in the art. The definition was not presented in the ROA for the purpose of limiting the scope of Applicants' disclosed subject matter. Moreover, the preferred scientific definitions of "rinse" do not state that agents used in rinsing or rinsing solutions must contain only water. Only the non-preferred, non-scientific definition of this term appears to contain language intimating that an agent or rinsing solution might be considered to contain only water. As stated above, the Court of Appeals of the Federal Circuit has cautioned against the use of such a non-scientific definition.

Furthermore, the scientific definitions, as well as any non-scientific definitions if they are to be applied, should not be applied dogmatically, as such an application might not even cover agents or rinsing solutions using only "deionized water." The application filed by Applicants on December 31, 1999 discloses, at lines 15-19 of page 8:

"In one embodiment, the rinsing solution comprises approximately 4% by volume of hydrogen peroxide, and generally comprises hydrogen peroxide in the approximate range of 2% to 4.5%. . . . The remainder of the rinse contains deionized water."

The Patent Office appears to be taking the position that agents or solutions used in rinsing, such as those disclosed in the cited embodiments, cannot be considered rinses because they contain 2% to 4.5% hydrogen peroxide, and do not contain only "water." The construction proposed by the Patent Office is strained, as it would prevent agents, solutions or rinsing solutions from being considered to be rinses simply because they contain even small amounts of chemicals in addition to water. Such a construction would eliminate the possibility of any patentable improvements in the make-up of agents for rinsing or rinsing solutions and would discourage research in this area of rinsing semiconductor wafers. Accordingly, Applicants respectfully disagree with the Patent Office's position.

Therefore, at least for the reason stated above, Applicants submit that claim 1 is not anticipated by Kishii, and is in condition for allowance. At this point, Applicants will not make any amendments to the pending independent claims, so as to preserve the claims in their present condition for appeal.

Claims 2-4 and 7 depend from claim 1, and, therefore, are also not anticipated by Kishii at least for the reason stated above in regard to claim 1.

As noted above, Applicants arguments in regard to independent claims 9 and 18 are similar to the argument that applies in respect of claim 1. Therefore, at least for the reasons stated above, in regard to claim 1, claims 9 and 18 are not anticipated by Kishii. More specifically, claim 9

recites a method comprising rinsing the surface of a metal plug with a solution comprising hydrogen peroxide. As stated above, Applicants submit that Kishii does not disclose rinsing, or, for that matter, the use of a solution comprising hydrogen peroxide to rinse a substrate. Independent claim 18 recites a method comprising introducing a rinsing solution onto a conductive plug, with the rinsing solution comprising hydrogen peroxide. Again, Applicants submit that Kishii does not disclose introducing a rinsing solution comprising hydrogen peroxide onto a conductive plug.

Claims 10-12 and 15 depend from claim 9, and, therefore, are also not anticipated at least for the reason stated above in regard to claim 9. Claim 19 depends from claim 18 and, therefore, is not anticipated at least for the reason stated above in regard to claim 18.

Independent claims 26-28 recite "introducing a second agent consisting essentially of hydrogen peroxide to rinse the surface of the metal plug" (claim 26), "rinsing the surface of the metal plug with a solution consisting essentially of hydrogen peroxide" (claim 27), and "introducing a rinsing solution onto the conductive plug, the rinsing solution consisting essentially of hydrogen peroxide" (claim 28). As stated above, Kishii does not disclose rinsing with an agent, solution or rinsing solution comprising hydrogen peroxide. Therefore, logically, it cannot anticipate a claim reciting an agent, solution or rinsing solution consisting essentially of hydrogen peroxide, because the latter claims reciting the transitional phrase "consisting essentially" are narrower than the claims using the transitional word "comprising".

Accordingly, Applicants respectfully request withdrawal of the rejection of claims 1-4, 7, 9-12, 15, 18, 19 and 26-28 under 35 U.S.C. § 102(e).

II. 35 U.S.C. § 103(a): Rejection of Claims 6, 8, 13, 14, 16, 17 and 20-22

Claims 6, 8, 13, 14, 16, 17, and 20-22 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kishii as applied to claims 1-5, 7, 9-12, 15, 18 and 19, and in further in view of principles of routine optimization. As noted in the ROA, in order to render a claim obvious, the relied upon reference(s) must teach or suggest every limitation of the claim such that the invention as a whole would have been obvious to one skilled in the art at the time the invention was made. Claim 1, from which claims 6 and 8 depend, discloses rinsing with an agent comprising hydrogen peroxide. Therefore, dependent claims 6 and 8 also contain this limitation. As stated above, Kishii does not teach rinsing, or the use of agents for rinsing or rinsing solutions comprising hydrogen peroxide. Kishii teaches an "acid cleaning process." (Kishii, col. 14, lines 56-57). The hydrogen peroxide used in Kishii is used as part of an acidic cleaning solution used in a "cleaning process. (See, generally, Kishii, col. 4, lines 3-34). Applicants are unable to find any suggestion of rinsing or using an agent comprising hydrogen peroxide to rinse a substrate. Therefore, at least

for the reason that claims 6 and 8 contain this limitation of claim 1, they cannot be rendered obvious by Kishii.

Claims 13, 14 and 16 depend from claim 9, which discloses rinsing with a solution comprising hydrogen peroxide. As stated above, Kishii does not teach or suggest rinsing, or the use of solutions comprising hydrogen peroxide in rinsing. At least for the reason that claims 13, 14 and 16 contain this limitation, they cannot be rendered obvious by Kishii.

Claims 20-22 depend from claim 18, which discloses introducing a rinsing solution comprising hydrogen peroxide. As stated above, Kishii does not teach or suggest rinsing or the use of rinsing solutions comprising hydrogen peroxide. At least for the reason that claims 20-22 contain this limitation, they cannot be rendered obvious by Kishii.

For the reasons stated above, Applicants request withdrawal of the rejections to claims 6, 8, 13, 14, 16, 17, and 20-22 under 35 U.S.C. §103(a).

III. 35 U.S.C. § 112, First Paragraph: Rejection of Claims 23-26

The Patent Office rejects claims 23-26 under the written description requirement of 35 U.S.C. § 112, first paragraph, as failing to convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Claims 23-25 recite agents, solutions and rinsing solutions consisting of hydrogen peroxide. Claim 26 recites an agent consisting essentially of hydrogen peroxide. The specification of the application, as filed (see line 7, page 7), states "[t]he metal layer is then rinsed with a solution that comprises hydrogen peroxide." Additionally, it is well established that the originally filed claims are part of the specification. In this regard, claims 1, 9 and 18, as filed, all recited agents, solutions or rinsing solutions comprising hydrogen peroxide. Therefore, it is clear that the specification, as filed, disclosed agents, solutions and rinsing solutions comprising hydrogen peroxide.

Accordingly, Applicants submit that the specification supports claims disclosing agents, solutions or rinsing solutions that contain any amount or ratio of hydrogen peroxide. A solution that consists of hydrogen peroxide or that consists essentially of hydrogen peroxide surely also comprises hydrogen peroxide. In this regard, it is well recognized that in claim construction "comprising" is broader than "consisting" or "consisting essentially". Thus, an originally filed claim reciting a substance comprising chemical X inherently supports new claims reciting substances that "consist of" or "consist essentially of" chemical X. In other words, a claim to a substance comprising X covers a substance having only X, as well as a substance having X along with other constituents. Therefore, it is submitted that agents, solutions or rinsing solutions consisting of, or consisting essentially of, hydrogen peroxide are supported by the specification of the application, as filed. As such, the application, as filed, conveys to one skilled in the art that Applicants were in possession of the claimed subject matter.

*Negative
Limitation*

At least for the reasons stated above, Applicants submit that claims 23-26 meet the written description requirements of 35 U.S.C. § 112. The FOA does not appear to reject claims 27 and 28 under the written description requirement. In any event, if the Patent Office did intend to reject these claims as well, Applicants submit that claims 27 and 28 meet the written description requirement at least for the same reasons that claims 23-26 meet the requirement. Accordingly, Applicants request withdrawal of the rejections of claims 23-26 (and 27 and 28, if applicable) under 35 U.S.C. § 112.

CONCLUSION

In view of the foregoing, it is believed that all claims now pending are now in condition for allowance and such action is earnestly solicited at the earliest possible date. If there are any fees due in connection with the filing of this response, please charge those fees to our Deposit Account No. 02-2666. If a telephone interview would expedite the prosecution of this Application, the Examiner is invited to contact the undersigned at (310) 207-3800.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Dated: February 19, 2002

By:



William Thomas Babbitt

William Thomas Babbitt, Reg. No. 39,591

CERTIFICATE OF MAILING:

I hereby certify that this correspondence is being deposited as First Class Mail, with sufficient postage, with the United States Postal Service in an envelope addressed to: Assistant Commissioner for Patents, Box AF, Washington, D.C. 20231 on February 19, 2002.



Marilyn Bass

February 19, 2002

RECEIVED
MAR - 7 2002
2800 MAIL ROOM

Attachment: Exhibit A (Heynes, Michael, Ph.D., et al., Semiconductor Terminology Graphic Glossary of Terms, Third Edition, 1999, cover page and pg. 91)